Substitute Specification

CLAIMS

I claim:

1. (Currently amended) Process for analysis of the structure of cultivated hedgerows adapted to a machine that is mobile in continuous operation in trained and/or staked plantations, such as vineyards, said process comprising the steps of:

utilizing an artificial vision system functioning by direct transmission to determine blockages of light between one or more emitters and one or more receivers placed facing each other, on either side of the hedgerow, and

handling information produced by these blockages of light by an electronic analysis system programmed or configured to examine the elements of the structure of the hedgerow, either during the day or at night.

2. (Currently amended) Process according to claim 1, further comprising:

eliminating influence of interfering solar light by using a light periodically modulated by the emitters, the receivers only being sensitive to the modulated light and not to the continuous component of the light.

3. (Currently amended) Process according to Claim 1, further comprising:

reducing significance of the interfering light by selecting emission and reception wavelengths for which the solar light is relatively weak, i.e. outside of the visible spectrum, either a wavelength of light less than 400 nm or greater than 750 nm, and, for example, a wavelength on the order of 950 nm.

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4. (Currently amended) Process according to Claim 2, wherein the artificial vision system comprises at least one front emitter and rear emitter, and at least one front receiver and a rear receiver, in considering the direction of the movement of the machine designed for this vision system, wherein each front emitter and rear emitter emits, in an alternating manner, for example, over a duration on the order of 500 μs, modulated light at a frequency corresponding to the frequency that matches the front receivers and rear receivers, respectively.

5. (Currently amended) Process according to claim 4, further comprising:

programming or configuring the electronic analysis system to handle the information generated by the blockages of light, in order to measure the speed of movement of the machine and to adjust the rotational speed of the rotary tools of the machine as a function of the measured speed of movement.

6. (Currently amended) Process according to Claim 1, further comprising:

programming or configuring the electronic analysis system to use the information generated by the blockages of light, in order to detect the stakes of the hedgerow.

7. (Currently amended) Process according to Claim 1, further comprising:

programming or configuring the electronic analysis system to use the information generated by the blockages of light, in order to detect the position of the cordon.

8. (Currently amended) Process according to Claim 1, further comprising:

programming or configuring the electronic analysis system to use the information generated by the blockage of light, in order to measure the health status of the plants.

9. (Currently amended) Device for analysis of the structure of cultivated hedgerows, for example, for equipment for mobile machines designed for continuous operation in trained and/or staked plantations, such as vineyards, said device comprising:

an artificial vision system functioning by direct transmission comprised of one or more emitters and one or more receivers, whereby this artificial vision system is arranged so that when it is mounted on a machine, one or more opto-electronic components thereof are arranged facing each other, on either side of the fruit-bearing hedgerow which spans the system; and

an electronic analysis system programmed or configured to use the information produced by the blockages of the light or order to visualize and analyze the elements of the hedgerow, either during the day or at night.

10. (Currently amended) Device according to claim 9, wherein the artificial vision system further comprises an emitter module comprised of at least one front emitter and rear emitter, and a receiver module comprised of at least one front receiver and a rear receiver, in considering the direction of the movement of the machine designed for this vision system, the distance separating the front emitter and the rear emitter being less than the width of the stakes of the paling of the fruit-bearing hedgerow.

11. (Currently amended) Device according to claim 10, wherein the receiver module comprises at least one front vertical row comprised of several spaced receivers and at least one rear vertical row comprised of several spaced receivers, each front emitter and rear emitter being able to emit, in an alternating manner, over a duration on the order of 500 μs, modulated light at a frequency corresponding to the frequency that matches the front receivers and rear receiver, respectively.

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12. (Currently amended) Device according to Claim 10, wherein the receiver module further comprises a third vertical row of receivers for which the lower receiver is located at the lower part of the receiver module, and in that the emitter module comprises, in the lower part, an emitter designed in order to emit, for example, every 500µs, light at a frequency corresponding to the frequency that matches the receivers of the third row.

13. (Currently amended) Device according to Claim 9, wherein the electronic analysis system is programmed or configured in order to handle the information generated by the blockages of light, in order to measure the speed of movement of the machine.

14. (Currently amended) Device according to Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockages of light, in order to detect the stakes of the hedgerow.

15. (Currently amended) Device according to Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockages of light, in order to detect the position of the cordon.

16. (Currently amended) Device according to Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockage of light, in order to measure the health status of the plants.

17. (Currently amended) Device according to Claim 9, wherein the emitter modules and receiver modules of the artificial vision system are affixed onto the chassis of the machine using mechanisms permitting a regulation of their position, mainly by height, relative to the chassis.

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18. (Currently amended) Device according to Claim 9, applied to pre-pruning machines, wherein the electronic analysis system is connected to the electro-distributor of the control valve that ensures the movement away from and return movement of the pruning elements of the cutting head of these machines.

19. (Currently amended) Device according to Claim 9, for the implementation of the process applicable to pre-pruning machines,

wherein the electronic analysis system is connected to the flow-regulation valve of the hydraulic circuit for supplying the hydraulic motors ensuring the rotary drive of the rotary cutting tools, whose speed of rotation is indicated to the electronic analysis system by a rotation sensor that is influenced by the measurement of this speed, which makes it possible to create feedback by closed loop with the electronic analysis system in order to adjust the rotational speed of the rotary tools as a function of the speed of movement of the machine.

20. (Currently amended) Device according to Claim 9, for implementation of the process applied to pre-pruning machines,

wherein the electronic analysis system is connected to an electronic distributor of the control valve ensuring the vertical movements of the pruning assemblies of these machines.

21. (Currently amended) Device according to Claim 9, for implementation of a process,

wherein the electronic analysis system is connected to a computer able to produce data to determine the health status of the plants.